



2014

EMG 242-3 Statistics for Management



Part C: Essay Questions

Marks allocation : 30 Marks

1. A factory has three machines, A, B and C, which produce bolts. The percentages of defective bolts produced by these machines are 2%, 5% and 10% respectively. Of all bolts produced by the factory, 60% are produced by A, 25% by B and 15% by C. A bolt is randomly chosen and checked for defects.
 - a) Draw a probability tree for this experiment. (3 Marks)
 - b) Find the probability that the bolt is defective. (3 Marks)
 - c) Find the probability that it is not produced by A and is defective. (4 Marks)(Total - 10 Marks)

2. Consider a computer system with Poisson job-arrival stream at an average of 2 per minute. Determine the probability that in any one-minute interval there will be
 - a) 0 jobs (2 Marks)
 - b) exactly 2 jobs (3 Marks)
 - c) What are the maximum jobs that should arrive one minute with 90 % certainty? (3 Marks)(Total - 08 Marks)

3. A bank has conducted a study to determine the efficiency of its transaction handling. The bank uses three different methods for handling customers' transactions: human tellers, automated tellers with keyboard and voice activated automatic tellers. The bank has collected information on the value of the transaction (in Dollars \$), the type of teller used and the time taken for the transaction.

The following notation has been used:

Y = Transaction time in minutes

X_1 = Transaction value (\$)

X_2 = Method of handling transaction, where: 1 = human teller,
2 = automated teller with keyboard,
3 = voice activated automatic teller.

The information was run through a multiple regression model and the following incomplete Tables are given below.